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AUTHOR Yeung, Alexander Seeshing; Lee, Frances Laimui
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ABSTRACT

This study examined the factor structure of a Chinese version of the Verbal, Math, Academic, and General self-concept scales of the Self Description Questionnaire (SDQII) administered to high school students in China at two time points. Responses of 487 students were used. Item scale correlations and reliability coefficients were good. Confirmatory factor analysis showed that math and Chinese self-concepts were positively correlated with academic self-concept, and with general self-concept, but smaller in size. However, math and Chinese self-concepts were negatively correlated with each other. When Chinese and math achievement scores were included in the model, Chinese achievement correlated more highly with Chinese than with math self-concept and math achievement correlated highly with math self-concept but not with Chinese self-concept. Both achievement scores correlated more highly with academic than general self-concept. These patterns were replicated in a second collection of data 6 months later. The results support the validity of the Chinese version of the SDQII and also the multidimensionality of self-concept. (Contains 2 tables and 36 references.) (Author/SLD)

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A Chinese Translation of the Self Description Questionnaire

Alexander Seeshing Yeung

University of Western Sydney, Macarthur

Frances Laimui Lee

University of New South Wales

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Abstract

This study examined the factor structure of a Chinese version of the Verbal, Math, Academic and General self-concept scales of the Self Description Questionnaire (SDQII) administered to high school students in China at 2 time points. Item scale correlations and reliability coefficients were good. Confirmatory factor analysis showed that Math and Chinese self-concepts were positively correlated with Academic self-concept, and with General self-concept but smaller in size. However, Math and Chinese self-concepts were negatively correlated with each other. When Chinese and math achievement scores were included in the model, Chinese achievement correlated more highly with Chinese than with Math self-concept and math achievement correlated highly with Math self-concept but not with Chinese self-concept. Both achievement scores correlated more highly with Academic than General self-concept. These patterns were replicated in a second collection of data 6 months later. The results support the validity of the Chinese version of the SDQII and also the multidimensionality of self-concept.

It is widely recognized that self-concept is an important factor that contributes to educational outcomes as well as an important outcome in its own right (Marsh, 1993). For example, using longitudinal data, Marsh and Yeung (1997a) demonstrated that academic achievement had substantial effects on subsequent academic self-concept after controlling for the effects of prior academic self-concept and that academic self-concept also had substantial effects on subsequent academic achievement after controlling for prior academic achievement. Marsh and Yeung (1997b) also showed that self-concept had significant effects on high school students' selection of coursework. More importantly, self-concept and academic affects have been found to be very domain specific (e.g., Marsh & Yeung, 1996; Marsh & Yeung, 1997a, 1997b) in that verbal and math self-concepts, for example, are different constructs in separate dimensions, each reflecting self-concept in a specific area. Thus recent research on self-concept and related issues has emphasized domain-specificity and the multidimensional nature of self-concept. In order to investigate issues related to self-concept, effective instrumentation that reflects the multidimensionality and hierarchical nature of self-concept is required (Byrne, 1984; Marsh, 1990a, 1993; Marsh, Byrne, & Shavelson, 1988). The present study investigates the multifaceted validity and stability of self-concept responses over time by high school students in China based on the Marsh (1992) Self Description Questionnaire instrument (SDQII).

Recent research with stronger methodological approaches has supported the multidimensionality perspective (e.g., Marsh, 1993; Marsh, Byrne, & Shavelson, 1988). More recently, Byrne and Gavin (1996) also found strong evidence of this multidimensionality across age groups. In general, researchers have found that academic achievement is more highly correlated with academic self-concept than with nonacademic self-concept (e.g., Byrne, 1984); and achievement and self-concept in matching academic domains (e.g., math test and math self-concept) are more highly correlated than in nonmatching academic domains (e.g., math test and English self-concept). Because of the importance of multidimensonality in understanding self-concept in educational settings, it is more appropriate to use instruments capable of measuring domain-specific self-concepts, such as the SDQII considered in this study, rather than instruments measuring more general academic self-concept. A good valid instrument for measuring academic self-concept should demonstrate strong support for domain-specificity in that verbal self-concept and math self-concept scales should clearly measure self-concepts in two different domains, and this support should be stable over time.

Derived from the Shavelson, Hubner, and Stanton (1976) hierarchical model of self-concept, Marsh (1987, 1992, 1993; also see Marsh, 1996; Marsh & O'Neill, 1984) designed a series of Self Description Questionnaires. Some of these instruments have been used worldwide and some have been translated into languages other than English. The validity of these translated instruments, in particular the SDQI, for young children (see Hon & Watkins, 1995; Martorell, Flores, Silva, & Navarro, 1992; Thomas, 1988; Watkins & Dong, 1994; Watkins, Juhasz, Walker, & Jamvlaitiene, 1995; Watkins & Mpofu, 1994; Watkins, Akande, & Mpofu, 1996) and the SDQIII for adolescents (see Byrne, 1988; Marsh, 1987; Bryne & Shavelson, 1986; Marsh & O'Neill, 1984) has been found to be promising, but less work has been done to examine the validity of the SDQII in a language other than English and in another cultural setting. In the present study, we examine the validity of a Chinese version of the SDQII which has the potential of a wide usage in future self-concept research.

The SDQ instruments differ from other self-concept instruments in their emphasis on the multidimensionality of self-concept, which has been strongly supported by recent research (e.g., Byrne & Shavelson, 1986; Marsh & Hocevar, 1985; Marsh & Shavelson, 1985). Historically, Marsh and Shavelson (1985) tested the Shavelson et al. (1976) hierarchical model of self-concept using the SDQI with primary students. The original model posited a general (global) self-concept at the apex of the structure beneath which were academic and nonacademic self-concepts each of which was further divided into self-concepts in various areas. Using a confirmatory factor analysis (CFA) approach, Marsh and Shavelson found that although there was support for the hierarchical structure, the correlation between verbal and math self-concepts was close to zero. A similar correlation was again found using the SDQIII with late adolescents (Marsh, 1987). Thus, evidence showed that verbal self-concept and math self-concept could not be combined to form a single school self-concept factor, and hence support for the multidimensionality of self-concept constructs.

As for the construct validity of the self-concept scales considered here, we expected (a) a higher correlation of Verbal and Math self-concepts with School self-concept than with General self-concept, (b) when exam scores were included as external criteria in the model, higher correlations between Chinese exam scores and Verbal self-concept and between math exam scores and Math self-concept than between non-matching subject domains, and (c) higher correlation between teachers' rating on schoolwork and School self-concept than General or subject-specific self-concepts. For the stability of the constructs over time, we expected (a) higher correlations between identical constructs in T1 and T2, and (b) similar relations among constructs over two time points.

Method

Participants

The participants were 511 students (174 in Grade 7, 166 in Grade 8, and 171 in Grade 9) from a prestigious state high school in a province in the southern part of China. Permission to participate in the study was obtained from the students and their parents. Because of absences and missing data, the following analyses used the responses of 487 students.

The SDQII Measures

Studies related to the stability of self-concept responses over time have typically used a global representation or a conglomerate of self-concepts, usually known as self-esteem (e.g., Newman & Wadas, 1997; Rasmussen, Willingham, & Gover, 1996; Roberts & Bengtson, 1996; Waschull & Kernis, 1996). In the present study, however, to address the stability of self-concept responses from a multidimensional perspective, the Verbal, Math, Academic, and General self-concept scales of the SDQII (Marsh, 1992) were used. Each SDQ item consisted of 10 items each using a 6-point response scale (1 = false to 6 = true). The items were translated into Chinese by a professional two-way translator and translated back into English by another translator to ensure identical meanings were essentially conveyed by the original and translated versions. SDQII responses were collected at two time points (T1 and T2) six months apart.

The Exam Scores

T1 exam scores of Chinese and math (in Term1 of the school year) were obtained about a month before the administration of the SDQII instrument. T2 exam scores were obtained about two weeks after the SDQII administration at T2. The exam scores were used as external criteria to critically evaluate the validity of the SDQII scales.

Teachers' Schoolwork Ratings

At T1, attitudes of students towards schoolwork were obtained by asking two teachers "what is the percentage of time the student can concentrate in a lesson" and "what is the percentage of time the student can concentrate in a school term" for each student. The mean score of the teachers' responses was used to infer students' Schoolwork. There were therefore two indicators (available at T1 only) for the Schoolwork construct that was used as one of the external criteria for evaluating construct validity.

Statistical Analyses

Responses to all negatively worded items (e.g., I do badly in tests of mathematics) were reverse scored so that higher scores reflected higher self-concept. Analyses were conducted with item pair scores; hence the 5 item pairs for each of 4 SDQ constructs, 2 schoolwork items each for Chinese and math, and exam scores for T1 and T2 Chinese and math yielded a 46 x 46 covariance matrix for confirmatory factor analysis (CFA). The approach of CFA and the use of item pairs have been described elsewhere (e.g., Bollen, 1989; Byrne, 1989; Joreskog & Sorborm, 1993; Marsh & O'Neill, 1984) and are not further detailed here.

Analyses were conducted with the SPSS version of LISREL (Joreskog & Sørbom, 1993) to test the a priori factor structure of the SDQII responses in nine models. The goodness of fit of these models (Table 1) is evaluated based on suggestions of Marsh, Balla, and McDonald (1988) and Marsh, Balla, and Hau (1996) with an emphasis on the Tucker-Lewis index (TLI) as well as the chi-square test statistic and the relative noncentrality index (RNI). The critical measures were the correlations among the SDQ constructs, and correlations between SDQ constructs and external criteria in matching and nonmatching domains. Joreskog (1979) emphasized that when the same

measurements are used on multiple occasions, the corresponding residual errors tend to be correlated. Specifically, researchers using the SDQ instruments on multiple occasions (e.g., Marsh & Yeung, 1997a) have shown that in order to get accurate estimates of relations among constructs, correlations among these errors must be included in the model. Therefore, in the present study, correlated uniquenesses were included in models considering both T1 and T2 measures.

Results

Preliminary Analysis

Reliability estimates for the Verbal, Math, Academic, and General self-concept scales are good (alphas = .85, .91, .85, and .77 for T1 and .85, .91, .87, and .86 for T2, respectively). The scores and reliability estimates for the other scales were almost identical over the two waves. The students in this school had generally high Verbal, Math, Academic, and General self-concepts (Means = 3.83, 4.42, 4.27, and 4.23 for T1, and 3.88, 4.47, 4.34, and 4.79 for T2, respectively). Although direct comparisons with other schools were not available, both the Chinese and math exam scores seemed high (Means = 77.92 and 78.10 for T1 and T2 Chinese and 80.13 and 84.65 for T1 and T2 math, respectively), reflecting the stringent selective criteria for high-ability students in this particularly prestigious school in the province. Interestingly, the mean scores for all General self-concept items were higher in T2 than in T1 (Mean scale score of 4.79 vs. 4.23) and the alpha reliability estimate tended to be higher in T2 (.86 vs. .77).

Nine CFA models were then tested, based on T1 data only, T2 data only, or both. A summary of the goodness of fit for each model considered here is given at Table 1. For Models 7, 8, and 9 in which two waves of data were included, models with or without correlated uniquenesses were tested. Because the corresponding model with correlated uniquenesses in each case provided a significantly better fit to the data, we report only models with correlated uniquenesses in Table 1. Because the pattern of results is consistent across all models considered in this study (e.g., substantial and statistically significant factor loadings, comparatively small uniquenesses), we only present in Table 2 Model 9 that included all parameters that were also found in other models.

Model 1: T1 SDQII Factors

The first model tested the factor structure of the SDQII responses at T1. Consistent with previous research, Verbal and Math self-concepts were more highly correlated with Academic self-concept (rs = .39 and .55, respectively) than with General self-concept (rs = .38 and .40, respectively), whereas no positive correlation was found between Verbal and Math self-concepts (r = -.13).

Model 2: T2 SDQII Factors

Consistent with Model 1, Verbal and Math self-concepts were more highly correlated with Academic self-concept (rs = .53 and .62, respectively) than with General self-concept (rs = .50 and .55, respectively), and no positive correlation was found between Verbal and Math self-concepts (r = .07). Results of Models 1 and 2 provided support for the convergent and discriminant validity of the SDQII responses considered here.

Model 3: T1 SDQII Factors With T1 Exam Scores As External Criteria

T1 Chinese and math exam scores were added to Model 1 to provide a stronger test of the factor structure of the SDQII responses. Validation of the factor structure on the basis of multidimensional self-concepts requires Chinese exam scores to be more highly correlated with Verbal self-concept than with Math self-concept, and math exam scores to be more highly correlated with Math self-concept than with Verbal self-concept. Consistent with a priori predictions, Verbal and Math self-concepts were more highly correlated with corresponding exam scores (rs =

.28 and .49, respectively) than with exam scores in non-matching domains (rs= .12 between Chinese exam and Math self-concept, and -.07 between math exam and Verbal self-concept, respectively).

Table 1

Goodness of Fit Summary for Alternative Models

Model	χ	df	PNI	TLI	GFI	PMSEA
1. Null model	5161.03	190				
4 T1 SDQ factors	355.06	164	.961	.955	.929	.049
2. Null model	5890.49	190				
4 T2 SDQ factors	424.75	164	.954	.947	.920	.039
3. Null model	5563.76	231				
T1 SDQ factors + T1 exam	460.65	196	.951	.931	.918	.048
4. Null model	6087.50	231				
T2 SDQ factors + T2 exam	491.59	196	.950	.941	.916	.039
5. Null model	6281.45	276				
T1 SDQ factors + exam & Sch	550.38	233	.947	.937	.912	.048
6. Null model	6727.32	276				
T2 SDQ factors + exam & Sch	543.43	233	.952	.943	.914	.038
7. Null model	13361.79	780				
T1 & T2 SDQ	1220.41	692	.958	.953	.888	.044
8. Null model	14327.17	946				
T1 & T2 SDQ + exam	1471.96	820	.951	.944	.879	.043
9. Null model	15145.48	1035				
T1 & T2 SDQ + exam, Sch	1614.61	895	.949	.941	.873	.043

Note: N = 487. The SDQII factors were Verbal, Math, Academic, and General Self-Concepts from 20 item pairs each for Times 1 and 2. Chinese and math exam scores (exam) and teachers' ratings of schoolwork (Sch) were used as external criteria for assessing construct validity. PNI = Relative noncentrality index. TLI = Tucker-Lewis index. GFI = Goodness-of-fit index. PMSEA = Root mean square error of approximation.

Model 4: T2 SDQII Factors With T2 Exam Scores As External Criteria

Consistent with Model 3, T2 Verbal and Math self-concepts were more highly correlated with exam scores in matching subject domains (rs = .28 and .32, respectively) than non-matching domains (rs= .11 between Chinese exam and Math self-concept, and -.04 between math exam and Verbal self-concept, respectively). Results of Models 3 and 4 provided even stronger support for the validity and consistency of the SDQII responses.

Model 5: T1 SDQII Factors With T1 Exam Scores And Schoolwork As External Criteria

Model 5 extends previous research by including a composite assessment of the students' attitudes towards schoolwork. In this extended model, validation of the SDQII responses requires, in addition to a high correlation between Chinese exam scores and Verbal self-concept and between math exam scores and Math self-concept, a higher correlation between this composite measure of Schoolwork and School self-concept than with Verbal or Math, and particularly General self-concept. The results strongly support the a priori structure in that Schoolwork was more highly correlated with School self-concept (r = .42), and less with Verbal (r = .10), Math (r = .25) or General self-concept (r = .29).

Model 6: T2 SDQII Factors With T2 Exam Scores And Schoolwork As External Criteria

Model 6 replicates Model 5, providing strong support for the a priori structure in that Schoolwork was more highly correlated with School self-concept (r = .47), and less with Verbal (r = .23), Math (r = .31) or General self-concept (r = .34).

Model 7: T1 and T2 SDQII Factors

To examine the stability of the SDQ responses, data for both T1 and T2 were included in Model 7. Specifically, Model 7 tests whether the same pattern of relationships among the latent constructs found in Models 1 and 2 that considered T1 and T2 constructs separately is consistent when data for both time points were included in a single analysis. Also to test the possibility that correlated uniquenesses need to be included in CFA models considering identical indicators on multiple occasions, we started with Models 7, 8 and 9 without including correlated uniquenesses. In all three models, the inclusion of correlated uniquenesses significantly decreased the χ^2 value with respect to df. Thus Models 7, 8 and 9 in Table 1 all had correlated uniquenesses included. In Model 7, T1 Verbal self-concept was highly correlated with T1 Academic self-concept (r = .39), T2 Academic self-concept (r = .32), T2 Verbal self-concept (r = .80), but was negatively correlated with T1 Math self-concept (r = -.13), and uncorrelated with T2 Math self-concept (r = -.07). T2 Verbal self-concept was highly correlated with T1 Academic self-concept (r = .41), T2 Academic self-concept (r = .53), but was uncorrelated with T1 or T2 Math self-concept (rs = -.01 and .07, respectively. These results support the construct validity and stability of the SDQII responses over two time points.

Model 8: T1 and T2 SDQII Factors With T1 and T2 Exam Scores As External Criteria

To provide a stronger test of the validity and stability of the SDQ responses, exam scores for both T1 and T2 were included in Model 8. The critical parameter estimates are the correlations of T1 and T2 exam scores with T1 and T2 self-concepts in matching and nonmatching subject domains. T1 Chinese exam was more highly correlated with T1 and T2 Verbal self-concept (rs = .28 and .30, respectively) than with T1 and T2 Math self-concept (rs = .12 and .12, respectively), and T2 Chinese exam was more highly correlated with T1 and T2 Verbal self-concept (rs = .17 and .28, respectively) than with T1 and T2 Math self-concept (rs = .07 and .11, respectively). A similar pattern of higher correlations between exam scores and self-concept in matching subject domains is also found in math. T1 math exam was more highly correlated with T1 and T2 Math self-concept (rs = .49 and .38, respectively) than with T1 and T2 Verbal self-concept (rs = -.08 and .00, respectively), and T2 math exam was more highly correlated with T1 and T2 Math self-concept (rs = .23 and .32, respectively) than with T1 and T2 Verbal self-concept (rs = -.07 and -.04, respectively). Again, these results show that the patterns of multidimensionality and domain specificity of the SDQ responses are consistent and stable over the two time points.

Model 9: T1 and T2 SDQII Factors With T1 and T2 Exam Scores And Schoolwork As External Criteria

Model 9 (Table 2) included the composite score of Schoolwork available at T1 in addition to exam scores as in Model 8. This provided an even stronger test of the validity and stability of the SDQ responses. Correlations among subject specific self-concepts and exam scores are similar to those in Model 8 and are not repeated here. Whereas there is strong support for the domain specificity of the subject-specific constructs, Schoolwork is more highly correlated with T1 and T2 Academic self-concept (rs = .42 and .47, respectively) than with T1 and T2 General self-concept (rs = .29 and .34, respectively), hence even stronger support for the construct validity of the academic self-concept components of the SDQII responses.

Stability over time. Since the factor correlations are similar across the models considered above, we evaluate the stability of the factor structure based on results in Table 2 that includes correlations among all relevant constructs. Stability of constructs over time requires a high correlation between each pair of identical constructs in T1 and T2, typically higher than correlations of that construct at T1 with other constructs at T2, or that construct at T2 with other constructs at T1. The results strongly support the stability of the constructs in that T1 and T2 Verbal self-concept (r = .80), Math self-concept (r = .82), Academic self-concept (r = .78), and General self-concept (r = .83) were correlated much higher than with any other constructs at either T1 or T2. These correlations are even stronger than the correlations between T1 and T2 Chinese and math exams (rs = .50 and .56, respectively). Together with the consistent patterns of positive correlations between T1 and T2 matching subject domains and nonpositive correlations between nonmatching subject domains, these results provided particularly strong support for the stability of self-concept responses to the four SDQII constructs in the Chinese version.

Discussion

The present study examines the factor structure and stability of self-concept responses using a Chinese sample of high-ability students. The results of this investigation clearly support the validity of the Chinese version of the SDQII, at least with this particular sample. Firstly, the factor structure clearly showed that Verbal and Math self-concepts were highly correlated with School self-concept. Secondly, a more demanding scrutiny of the construct validity by including Chinese and math exam scores in the model showed high correlations between achievement and self-concepts of matching academic domains and low correlations between achievement and self-concepts of nonmatching academic domains. This result provided strong support for the construct validity of the SDQII, particularly the Verbal and Math self-concept scales that are designed to measure these respective self-concepts. Thirdly, to extend previous research, we added a general schoolwork measurement as another external criterion to test the between-network relations and the discriminant validity of the construct. Results showed that the Schoolwork criterion was more highly correlated with Academic self-concept and less with other constructs. These results also indicated that the multidimensional perspective is applicable to Chinese students as well as high-achievers. Fourthly, for the stability of the four constructs over time, a higher correlation between identical constructs in T1 and T2, and consistent patterns of relations among constructs over the two time points supported the stability of these constructs.

With an apparently increasing interest in research on self-concept and related issues with Chinese-speaking samples, the validation of the SDQ instruments is important. The findings implies that the Chinese version of the SDQII is valid for at least the sample considered in the present study, although further investigation may be required for generality to other samples. However, a major limitation of the present study is that in the CFA conducted with the latent variables of Chinese and math achievement scores, only one single item for each was available (Chinese exam score and math exam score, respectively), hence not allowing proper tests of the reliability of the indicator and corrections for unreliability. Furthermore, although the results show strong stability of the multidimensional self-concept structure over time, the time span was only about six months. Stronger tests of the stability may include data collection for longer durations or on multiple occasions. Thus further research should try to address these two issues.

To sum up, the present study found that the multidimensionality and domain-specificity of self-concept can be generalized to the sample of Chinese students considered here; and the structure of Verbal, Math, Academic, and General self-concepts are stable over at least six months. With apparently increased interests in self-concept research in Asian countries, the use of multidimensional instruments, such as the SDQII considered in this study, is important for understanding self-concept from a multidimensional perspective.

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Table 2
CFA Solution for Model 9: Stability of 2 waves of SDQII factors

	Latent Variables													Uniq
	T1MS	T1VS	T1AS	T1GS	T2MS	T2VS	T2AS	T2GS	T1ME	T1CE	T2ME	T2CE	T1SCH	
Factor Loadings														
T1MSP1	.81*	0	0	0	0	0	0	0	0	0	0	0	0	.34*
T1MSP2	.74*	0	0	0	0	0	0	0	0	0	0	0	0	.45*
T1MSP3	.85*	0	0	0	0	0	0	0	0	0	0	0	0	.28*
T1MSP4	.84*	0	0	0	0	0	0	0	0	0	0	0	0	.29*
T1MSP5	.89*	0	0	0	0	0	0	0	0	0	0	0	0	.20*
T1VSP1	0	.78*	0	0	0	0	0	0	0	0	0	0	0	.40*
T1VSP2	0	.70*	0	0	0	0	0	0	0	0	0	0	0	.51*
T1VSP3	0	.78*	0	0	0	0	0	0	0	0	0	0	0	.39*
T1VSP4	0	.76*	0	0	0	0	0	0	0	0	0	0	0	.42*
T1VSP5	0	.66*	0	0	0	0	0	0	0	0	0	0	0	.57*
T1ASP1	0	0	.69*	0	0	0	0	0	0	0	0	0	0	.52*
T1ASP2	0	0	.71*	0	0	0	0	0	0	0	0	0	0	.50*
T1ASP3	0	0	.71*	0	0	0	0	0	0	0	0	0	0	.49*
T1ASP4	0	0	.76*	0	0	0	0	0	0	0	0	0	0	.43*
T1ASP5	0	0	.80*	0	0	0	0	0	0	0	0	0	0	.35*
T1GSP1	0	0	0	.60*	0	0	0	0	0	0	0	0	0	.64*
T1GSP2	0	0	0	.64*	0	0	0	0	0	0	0	0	0	.59*
T1GSP3	0	0	0	.59*	0	0	0	0	0	0	0	0	0	.65*
T1GSP4	0	0	0	.66*	0	0	0	0	0	0	0	0	0	.57*
T1GSP5	0	0	0	.74*	0	0	0	0	0	0	0	0	0	.45*
T2MSP1	0	0	0	0	.79*	0	0	0	0	0	0	0	0	.37*
T2MSP2	0	0	0	0	.76*	0	0	0	0	0	0	0	0	.43*
T2MSP3	0	0	0	0	.85*	0	0	0	0	0	0	0	0	.28*
T2MSP4	0	0	0	0	.81*	0	0	0	0	0	0	0	0	.34*
T2MSP5	0	0	0	0	.88*	0	0	0	0	0	0	0	0	.22*
T2VSP1	0	0	0	0	0	.80*	0	0	0	0	0	0	0	.36*
T2VSP2	0	0	0	0	0	.71*	0	0	0	0	0	0	0	.50*
T2VSP3	0	0	0	0	0	.80*	0	0	0	0	0	0	0	.36*
T2VSP4	0	0	0	0	0	.74*	0	0	0	0	0	0	0	.45*
T2VSP5	0	0	0	0	0	.64*	0	0	0	0	0	0	0	.59*
T2ASP1	0	0	0	0	0	0	.70*	0	0	0	0	0	0	.50*
T2ASP2	0	0	0	0	0	0	.70*	0	0	0	0	0	0	.50*
T2ASP3	0	0	0	0	0	0	.77*	0	0	0	0	0	0	.40*
T2ASP4	0	0	0	0	0	0	.78*	0	0	0	0	0	0	.39*
T2ASP5	0	0	0	0	0	0	.80*	0	0	0	0	0	0	.36*
T2GSP1	0	0	0	0	0	0	0	.77*	0	0	0	0	0	.41*
T2GSP2	0	0	0	0	0	0	0	.73*	0	0	0	0	0	.46*
T2GSP3	0	0	0	0	0	0	0	.71*	0	0	0	0	0	.50*
T2GSP4	0	0	0	0	0	0	0	.72*	0	0	0	0	0	.48*
T2GSP5	0	0	0	0	0	0	0	.81*	0	0	0	0	0	.34*
T1ME	0	0	0	0	0	0	0	0	1	0	0	0	0	0
T1CE	0	0	0	0	0	0	0	0	0	1	0	0	0	0
T2ME	0	0	0	0	0	0	0	0	0	0	1	0	0	0
T2CE	0	0	0	0	0	0	0	0	0	0	0	1	0	0
T2SCHP1	0	0	0	0	0	0	0	0	0	0	0	0	.86*	.26*
T2SCHP2	0	0	0	0	0	0	0	0	0	0	0	0	.85*	.27*
Correlations among constructs														
T1MS	--													
T1VS	-.13*	--												
T1AS	.55*	.39*	--											
T1GS	.40*	.38*	.87*	--										
T2MS	.82*	-.07	.49*	.44*	--									
T2VS	-.01	.80*	.41*	.42*	.07	--								
T2AS	.41*	.32*	.78*	.74*	.62*	.53*	--							
T2GS	.33*	.32*	.69*	.83*	.55*	.50*	.90*	--						
T1ME	.49*	-.08	.31*	.08	.38*	-.00	.27*	.09	--					
T1CE	.12*	.28*	.36*	.24*	.12*	.30*	.30*	.19*	.38*	--				
T2ME	.23*	-.07	.22*	.11*	.32*	-.04	.29*	.18*	.56*	.30*	--			
T2CE	.07	.17*	.26*	.20*	.11*	.28*	.26*	.20*	.21*	.50*	.20*	--		
T1SCH	.25*	.10	.42*	.29*	.31*	.23*	.47*	.34*	.50*	.60*	.45*	.46*	--	

Note. N = 487. Math, Verbal, Academic, and General Self-concepts constructs (MS, VS, AS, and GS, respectively) were measured over Times 1 and 2 (T1 and T2) with item pairs (P1 to P5). CE = Chinese exam. ME = math exam. SCH = schoolwork as rated by teacher. Uniq = uniqueness. Parameters with values of 0 or 1 were fixed in the definition of the model.
$p < .05$

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